Climate Program Office Review
May 24-26, 2022

Pre-Recorded Presentation Supporting Activity Area 1: Climate Science / Earth System Science and Modeling

Climate Variability and Predictability (CVP) Program
Sandy Lucas                 Jose Algarin
Federal Program Manager    Program Specialist, UCAR
CVP 101

CVP is a global research program, with regional focus areas where predictability of climate signals is highest. Its goal is the process-level understanding of the coupled ocean-land-atmosphere-ice-systems. CVP uses:

- Process studies, modeling and field campaigns
- Historical: had land-focus area and Arctic-focus but it was lost during budget contractions,

Program Manager: Sandy Lucas, PhD

Program Specialist: Jose Algarin

✓ Specific Mandates: Global Change Research Act, Weather Act (2017)
✓ Historical considerations: Strong linkages to US CLIVAR and WCRP topics; Interagency and International collaboration, leverage funding
✓ Still has strong international collaborations

Note: Significant year-over-year intra-category variability is due to front-funding. Field campaigns are more expensive than modeling studies.
CVP 101, cont.

FY17-21 Research Portfolio

Air-Sea Interaction and Convection - Field Campaigns (FY17, FY18, FY19)

Bridging Observations and Modeling (FY19, FY20, FY21)

Decadal Variability and Predictability (FY20)

Special Topics: Changing Ocean-Fisheries (FY20); Explaining Extreme Events (FY20)

Active Awards during Review Period

- Arctic Sea Ice ($5.51M)
- DYNAMO CPT ($2.99M)
- AMOC ($5.38M)
- Maritime Continent YMC ($7.4M)
- CVP-TPOS Pre-Field ($3.96M)
- CPT w/ NSF ($2.3M)
- ATOMIC Field Campaign ($6.5M)
- Decadal Climate Variability and Predictability ($6.78M)
- Explaining Climate Extreme Events ($2.45M)
- Climate and Changing Ocean Conditions ($1.96M)
- Innovative Ocean Dataset/Product ($2.67M)

Projects by Year:

- 11 Projects FY15
- 2 Projects FY15
- 13 Projects FY16
- 17 Projects FY17
- 8 Projects FY18
- 3 Projects FY19
- 10 Projects FY19
- 10 Projects FY20
- 7 Projects FY20
- 4 Projects FY20
- 6 Projects FY21
Key Accomplishments (FY17-21)

Quality

**Most Cited Publication, By Year**

- Ding, Qinghua, et al. (2017) "Influence of high-latitude atmospheric circulation changes on summertime Arctic sea ice." *Nature Climate Change* 173


- Dai, Aiguo, et al. (2019) "Arctic amplification is caused by sea-ice loss under increasing CO2." *Nature Communications* 144


- Stephan, Claudia Christine, et al. (2021) "Ship-and island-based atmospheric soundings from the 2020 EUREC4A field campaign." *Earth System Science Data* 6

Total Publications, by Journal (394 total)

- Nature Climate Change
- Journal of Climate
- Geophysical Research Letters
- Climate Dynamics
- Journal of Advances in Modeling Earth Systems
- Nature (all)
- JGR Atmospheres
- JGR Oceans
- Other (incl. JAMES, Frontiers in Marine Science, Inari Journal of Climatology, etc.)
Key Accomplishments (FY17-21)

Relevance

Strategic Partnerships

NOAA
- OAR Labs: PMEL, AOML, PSL, CSL, GFDL
- OAR Programs: GOMO, UAS, WPO
- NWS: CPC, EMC, OSTI-Modeling Division

Academia: Universities in 20+ states, plus international

Private sector: NOFO, NOAA-agreements

Federal agencies: NSF, ONR, NASA, DOE

Community-Driven: US CLIVAR, USGCRP, WCRP, Int’l CLIVAR

Actively engaged with various NOAA/CPO priorities:
Precipitation Prediction Grand Challenge, Climate and Fisheries Initiative, Coastal Inundation Initiative, Explaining Extremes Attribution, ENSO+Impacts in Changing Climate

CVP- Funded Labs and Institutes (FY2017-2021)
Key Accomplishments (FY17-21)

Performance

In the past 5 years,

- **2 Field Campaigns Completed:** (YMC, ATOMIC)
  - Preparing for #3: Tropical Pacific field campaign with modeling studies, monthly PI Team meetings. New proposals under review
  - ATOMIC, in Barbados, Tropical Clouds, Air-Sea Interaction
    - Special Collection in Earth System Science Data; Data free at NCEI
- **3 Projects** on AMOC as a driver of sea level changes on the US East coast, Coastal Inundation is a CPO Risk Area
- **3 CPTs** NCAR/GFDL/Academia hosting annual meetings
- **10+ Workshops**
  - Atmospheric Convection and Air-Sea Interactions over the Tropical Oceans; – Tropical Pacific Obs Needs
  - AMOC Metrics: Coordinating Observations and Models
  - Sources and Sinks of Ocean Mesoscale Eddy Energy
  - Funded in collaboration with US CLIVAR agencies
- **2 AGU Town Halls, 4 AGU sessions, 10 YMC Webinars**
- **90-120 Publications** per year
- **120 Projects:** 65 new and 55 projects sun習ed in 5 years

CVP By The Numbers
FY17-FY21

- 160 proposals received, 65 projects started and funded
- Success rate: 25%, from LOIs to funded projects
- Of all of the applicants, CVP funded ~31% of total dollars requested
Key Accomplishments (FY17-21)

Cross Program Efforts
- FY18 CVP-TPOS Pre-Field
- FY20 Changing Oceans Marine Ecosystems
- FY20 Explaining Extremes Type 1 & 2
- FY21 Innovative Ocean Datasets

International Efforts
- FY17 YMC Field Campaign
- FY19 CPTs# Ocean-Atm
- FY19 ATOMIC Field Campaign

Interagency Efforts
- Co-Funding * with COM, MAPP
- ^ with COM, GOMO Office
- + with ONR
- # with NSF

ATOMIC is the U.S. contribution to EUREC4A
January 6 – February 15, 2020
It is an ocean, atmosphere, and cloud study off the coast of Barbados

ATOMIC Field Campaign
NOAA Led, Innovative Technology - Big Science
Strategic Lookahead

- **Drivers:**
  - National and International Research Topics (US CLIVAR, WCRP)
  - Development TPOS field campaign
  - Emerging NOAA priority PPGC and GPEX. CVP’s role in engaging the external community and NOAA internal community
  - Ongoing priority of CPO areas: Coastal Risk Area, NOAA Climate and Fisheries Initiative

- **Some Strategic Considerations:**
  - CVP has moved to more applied research themes (Climate-Fish, Coastal Inundation) rather than foundational research (process understanding, predictability).
    - Is applied research the best investment? The right balance?
  - Should CVP continue to expand research themes that are driven by Labs, WPO, NWS/CPC, NMFS or others? Or, refocus on the external community’s research directions?
  - Should CVP keep a role in Arctic research given other Programs in OAR?
  - CVP Field Observation dataset/product development is relevant to many NOAA and CPO priorities.
    - Is CVP providing the most benefit, largest impact?

**FY22 Competitions:**

1. Joint Competition to Advance Process Understanding and Representation of Precipitation in Models (CVP/NWS-OSTI)
2. Observation and Modeling Studies in Support of Tropical Pacific Process Studies, Pre-Field-II (CVP)
Backup Information

CVP Website  
https://www.cpo.noaa.gov/cvp

CVP Funded Projects  
https://www.cpo.noaa.gov/Meet-the-Divisions/Earth-System-Science-and-Modeling/CVP/Funded-Projects

CVP PI Webinar Series  
https://www.cpo.noaa.gov/Meet-the-Divisions/Earth-System-Science-and-Modeling/CVP/Webinars#741281-webinars

CBS News Feature - ATOMIC -  